QUANTITATIVE BEHAVIOR OF YOUNG CHILDREN AT THE TIME OF ENTRANCE INTO FIRST GRADE

BY

GLADYS LONGINO JONES

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M.A., Ohio State University, 1948

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AN ABSTRACT OF A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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I. The Problem

In an age of scientific method much of any individual's thinking is quantitative. But the quality of this thinking is conditioned by the individual's ability to understand and deal with the interrelationships among his number ideas. A child's number language is one clue to his typical quantitative thinking. His behavior in formal test situations where number is present and he is required to give some attention and thought to that number provides a measure of his maximum quantitative behavior.

The purpose of this study is to determine: (1) the relationship between the child's maximum quantitative behavior or number ability in the standardized test situation and the child's typical quantitative behavior in a standardized play situation; (2) the relationship between the child's typical quantitative behavior and his quantitative understanding as revealed in the child's explanation of his quantitative thinking. This study is further concerned with relating an individual's typical quantitative behavior and quantitative understanding to factors of sex, intelligence, paternal occupation, quantitative experiential background, verbal ability, number ability, and number expression in the classroom.

II. The Method Of The Study

The sample included five girls and five boys in Groups I, II, III, V, VI, and four girls and four boys in Group VII of the Minnesota Scale for Paternal Occupations, making a total of 58. Each subject was a first grade entrant in a public school in Decatur, Illinois. All subjects had attended public kindergarten for one or more years. The sample was selected

by sex and urban occupational levels in such a manner that the effect of such factors as age, sex, and intelligence on both maximum and typical performance in quantitative situations could be studied.

The SRA Primary Mental Abilities for Ages 5 to 7 was administered by the experimenter to each subject to obtain a measure of intelligence. The Quantitative sub-test was treated as a measure of the subject's maximum quantitative performance and the score derived from this test was designated Number Ability or NA. In like manner, the Verbal-Meaning sub-test was used as a measure of the child's maximum verbal performance and the score was called Verbal Ability or VA.

Two measures of typical quantitative behavior were obtained in a play situation in which the experimenter and the subject played three games: one, a measure of quantitative behavior involving the use of number knowledge and computational skills, and the other, a measure of quantitative understanding as revealed in the child's language which he used to explain his quantitative behavior. The child's computational responses in the play situation were recorded. From these responses a score, designated as Quantitative Behavior, or QB, was derived. The child was asked to explain his choice of response to 16 of the items in the measure of Quantitative Behavior. A scaling procedure was applied to these 16 responses and a score called Quantitative Understanding, or QU, was derived for each child in the play situation.

For a third measure of typical quantitative performance the children were observed by the experimenter in classroom activities other than those involving instruction in number. This was an attempt to determine the amount of quantitative expression used and its realtion to Number Ability as measured in the formal situation and to Quantitative Behavior and Quantitative Understanding observed in the play situation. Finally, an attempt was made to determine the quality and quantity of preschool quantitative experiences of these children by interview with one of their parents.

Conclusions

Play situations can be designed to elicit quantitative behavior and to reveal children's quantitative understanding. Furthermore, these two performances can be studied without the children's awareness. The reliability of this type of situation as a measure of typical quantitative behavior agrees well with that of formal test situations as a measure of number and verbal ability.

Children in the play situation reflect their intellectual capacities and individual differences associated with sex and socio-economic status. This study of typical quantitative behavior confirms the findings of previous investigations in number and language behavior of children. It discloses a significant relationship between children's quantitative behavior and quantitative understanding in the play situation and the level of their number and verbal abilities as measured by the formal test.

Children typically indicate in their language in the classroom little sensitivity to quantitative aspects of their environment. The girls, enabled by their superior intelligence and number ability, express verbally in superior degree their awareness of quantity, size, and number in the environment.

Parents report more preschool quantitative experiences for boys than girls. Such experiences reuslt in accuracy in handling number concepts and processes but they do not seem to develop understanding of the concepts or the skills used. In the case of boys, the greater the amount of such experiences, the greater is the sensitivity to and skill in handling numbers. With girls, the greater the amount of quantitative experiences, the greater the number language development.

Number ability contributes equally to performance in both quantitative behavior and quantitative understanding. Such behaviors can be said to be dependent upon and determined by the degree to which number ability is applied in the situation.

Quantitative understanding is dependent upon the ability

to verbalize quantitative behavior and involves the understanding of abstract symbols and processes in the number system. But, possession of superior general verbal ability is not necessarily an indication that the child is or will be able to handle abstract terms and symbols needed to analyze the number skills he possesses and is able to use effectively.

VITA

Gladys Longino Jones was born on August 29, 1913, in Pitkin, Louisiana. After graduating from C. E. Byrd High School, Shreveport, Louisiana, she entered the Northwestern State College of Louisiana and received the degree of Bachelor of Arts, with honors, from that institution in June, 1935. She was a sixth grade classroom teacher in the public schools of Caddo Parish, Louisiana, for the following seven years. In 1943 she was commissioned into the Army of the United States and served as recruiting officer in the Third Service Command and personnel officer with the Army Air Forces in continental assignments. Upon relief from active duty from the Army in 1947, she entered the Graduate College of the Ohio State University, from which she received the Master of Arts degree in 1948. She was a first grade teacher, Nashville, Tennessee, during the academic year 1948-49; during the summers of 1948 and 1949 she pursued advanced graduate work at George Peabody College for Teachers. In September 1949, she entered the Graduate College of the University of Illinois and held an Assistantship in Education for the academic year 1949-50 and an Instructorship in the academic years 1950-52.